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March 9, 2004

TO: Each Supervisor

FROM: Thomas L. Garthwaite, M.D.
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SUBJECT: **PROPOSED REMEDIATION OF THE ROCKETDYNE FACILITY IN THE SANTA SUSANA FIELD LABORATORY**

At the December 16, 2003 meeting, the Board approved a motion by Supervisor Antonovich, instructing the Directors of Health Services and Public Works to investigate the inconsistency between the requirements of the Environmental Protection Agency (EPA) and the Department of Energy (DOE) associated with the proposed remediation of the Rocketdyne Facility in the Santa Susana Field Laboratory near Simi Valley. Attached is the response to this directive.

The inconsistency between the EPA and DOE requirements is primarily a process issue, rather than an issue regarding the protective value of the final decommissioning criteria used at the Rocketdyne Facility. Differences in processes, including site characterization and risk evaluation, may result in different final criteria. In general, these differences will not result in a measurable or verifiable impact to health and safety.

If you have any questions or need additional information, please let me know.

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Attachment

c: Chief Administrative Officer
County Counsel
Executive Officer, Board of Supervisors
Director of Public Works

# REPORT ON PROPOSED REMEDIATION OF THE ROCKETDYNE FACILITY

At the December 16, 2003 meeting, the Board instructed the Directors of Health Services and Public Works to investigate the inconsistency between the requirements of the Environmental Protection Agency (EPA) and the Department of Energy (DOE) associated with the proposed remediation of the Rocketdyne Facility in the Santa Susana Field laboratory near Simi Valley.

## BACKGROUND

The Rocketdyne Santa Susana Field Laboratory (SSFL) is located on approximately 2850 acres of land atop a range of hills between the Simi and San Fernando Valleys in Southeastern Ventura County. The eastern boundary of the site is close to the border of Los Angeles County, and a substantial number of residents in the Los Angeles communities of Chatsworth, Chatsworth Lake, West Hills, Canoga Park, Hidden Hills, and Woodland Hills live within five miles of the border of the SSFL facility. From the mid-1950's to the late 1980's, radioactive materials were used by the DOE on an estimated 90-acre parcel within the 290-acre western portion of the 2850-acre SSFL site, which is the area commonly identified as Area IV. DOE is currently in the process of remediating this portion of the site so that it can ultimately be used for other purposes, e.g., residences.

In addition to radioactive materials, there were also hazardous chemicals (e.g., TCE, perchlorates) used at both Area IV and other areas of the larger site where rocket testing occurred over many years on behalf of other government agencies. Contamination due to hazardous chemicals is being addressed in the site remediation also, but both the DOE and the EPA agree that the "inconsistency" relates solely to the radioactive contaminants and not to the hazardous chemical contaminants that may remain at the site.

## DISCUSSION

Based on discussions with the agencies, written comments from the agencies, and a review of the relevant statutes and regulations, it appears the "inconsistency between requirements of the EPA and the DOE concerning what levels of remediation may be appropriate," is primarily a question relating to the process used to determine the final criteria, and not necessarily a difference of opinion regarding the final cleanup criteria.

The DOE concurs with this characterization of the issue. The EPA prefers to characterize the difference as one between the prescribed site characterization and cleanup requirements of the Comprehensive Environmental Response, Cleanup and Liability Act (CERCLA), and DOE's proposed characterization and cleanup methodology. However, a reading of CERCLA and regulations promulgated under CERCLA makes it clear that CERCLA does not prescribe cleanup levels, but rather prescribes a process for determining what final cleanup levels might be appropriate at a site on a case-by-case basis.

There are three principal U.S. government agencies that share jurisdiction over cleaning up former radioactive material use sites.[1] The U.S. Nuclear Regulatory Commission (NRC) is responsible for most site radiological cleanups in the U.S. They directly regulate some of these cleanups, and they indirectly do so through states that have entered into agreements with them. These states are called Agreement states (California is an Agreement State.) Neither NRC nor states under their Agreement State authority regulate DOE facilities such as the portion of the SSFL site in question.

DOE is the second agency with jurisdiction over former radioactive material use sites. DOE is generally responsible for regulating their own radiological activities, including site cleanups.[2]

The third agency with jurisdiction over the cleanup of sites with radioactive contamination is the EPA. The EPA's jurisdiction, relevant to this discussion, extends to those sites listed on the National Priorities List (NPL), pursuant to CERCLA. EPA would therefore only have regulatory authority over this DOE site if it were listed on the NPL. The SSFL site has not been listed on the NPL, although EPA did evaluate it based on radiological contamination to see if it met the criteria for that listing. The SSFL site scored substantially below the hazard ranking of 28.5, at which sites are eligible for listing on the NPL. The SSFL site radiological cleanup, therefore, is being conducted solely under the jurisdiction of DOE. In EPA's words, "EPA does not have lead responsibility over radiologic cleanup decisions at non-NPL DOE facilities such as SSFL, and does not have regulatory oversight authority."

Both NRC and DOE use similar methodology and dose-based criteria for decommissioning former radioactive material use sites. NRC and DOE generally use a criterion of 25 millirem per year to future site users as the starting point for their site cleanups. They then apply a principal called ALARA (As Low as Reasonably Achievable) to determine if it is reasonable to require further reduction in the cleanup criteria (i.e., less than 25 millirem per year). At SSFL, DOE utilizes the same ALARA process, but decided to use a more conservative initial criterion of 15 millirem per year for their cleanup starting point. Therefore, at SSFL DOE is slightly "safer" than NRC in their initial cleanup criterion.

Both NRC and DOE use similar processes to establish their decommissioning criteria, including the same or similar computer aides (RESRAD) for converting their cleanup objective (e.g., 25 millirem per year or 15 millirem per year) to corresponding radiological concentrations. In addition, unlike the EPA process, this criterion of 15 millirem per year is an absolute cap in any given year, not an average over a lifetime.

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[1] It should be noted that EPA expressed a preference to discuss the three agencies' responsibilities in terms of the enabling statutes, the Atomic Energy Act and CERCLA, rather than in more generic terms regarding the agencies' jurisdiction. The discussions come to equivalent conclusions regarding jurisdiction at DOE sites, and sites listed on the National Priorities List by EPA.

[2] The EPA notes that the DOE and EPA entered into a joint policy stating, "The DOE Decommissioning Program will conduct decommissioning activities in compliance with applicable requirements of CERCLA and the [National Contingency Plan]." (The "National Contingency Plan," is codified in regulation in 40 CFR 300.) There is disagreement between DOE and EPA concerning whether this "agreement" refers to the process utilized or the outcome of the process (cleanup criterion) for the SSFL site.

Both the NRC and the DOE also use a similar process for characterizing contamination at a site, and designing surveys to support the characterization and final status of the site. This process is described in the "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM), a document developed jointly by EPA, NRC, DOE and the Department of Defense.

EPA, on the other hand, uses the "CERCLA process," including its own models for exposure analyses (i.e., not RESRAD), and supplements MARSSIM with additional internal guidance, for the ultimate task of selecting remedial criteria. The CERCLA process discusses the selection of a "remedy" or remedial criteria in terms of risk rather than dose.[3] EPA has expressed a strong preference for discussing the remedial criteria in terms of risk, but since the risk to an individual derives from the dose to an individual, the issue is more a matter of semantics than science.

For the purpose of this discussion, we note that most health physicists and other radiation protection professionals use a generic conversion of dose to risk, such that the EPA's lower bound of risk of one in one million ($10^{-6}$) excess lifetime cancers is approximately equal to an average annual dose of 0.05 millirem per year over a 30-year residency period, and their upper bound of one in ten thousand ($10^{-4}$) excess lifetime cancers is approximately equal to an average annual dose of 5 millirem per year over a 30-year residency period. However, doses in individual years may have results that are higher than the average annual dose.

In addition, as EPA noted in a written communication, the lower end of the risk range ($10^{-6}$ or approximately 0.05 millirem per year) is used as the point of departure for selecting cleanup level. Eight other regulatory criteria are then used to determine whether a risk greater than $10^{-6}$ is appropriate. Although a risk range of $10^{-4}$ to $10^{-6}$ is cited as the acceptable exposure levels for carcinogens, the CERCLA process allows EPA to exceed this range on a case-by-case basis.

With respect to the SSFL site, EPA has stated in public meetings that they do not know what decommissioning criterion they would consider appropriate for the site, although they have conceded that it is possible they would agree that a risk criterion equivalent to approximately 15 mrem per year is acceptable. For example, in a meeting of a Los Angeles City Council committee, the EPA provided a discussion of the differences between the EPA and DOE approaches at SSFL, stating, "While EPA acknowledges that the DOE's 15 millirem per year number may fall within EPA's risk range, we disagree that the DOE's rationale and process used for selecting that cleanup level is consistent with CERCLA," and stating, "Ultimately, both EPA and the DOE's approaches could conceivably result in the same level of cleanup where radiological materials are detected."[4]

In preparing this response for the Board, the EPA provided comments. From the EPA's perspective, the key inconsistencies between the DOE's methodologies and the EPA's CERCLA process are that: 1) DOE's radiologic site characterization was not sufficient to support the

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[3] The "CERCLA" process, as described in part at 40 CFR 300.430, offers guidance on the selection of remedial goals stating that consideration should be given to the acceptable exposure levels for carcinogens, which are "generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between $10^{-4}$ and $10^{-6}$ using information on the relationship between dose and response. The $10^{-6}$ risk level shall be used as the point of departure for determining remediation goals.

[4] Refer, specifically to the comments of Arlene Kabei to the Los Angeles City Council Environmental Quality and Waste Management Committee on April 16, 2002, provided by the EPA in response to our request for information and comments on this document. A copy the full comments is available upon request.

remedy selection methodology provided in the CERCLA regulation, 2) the DOE used dose in selection of the critiera rather than risk, and 3) the DOE used a dose of 15 millirem per year, rather than $10^{-6}$ cancer risk as their "point of departure" for selecting an appropriate cleanup level. It is Los Angeles County's understanding that DOE has revised some criteria, and that DOE is using a maximum dose of 15 millirem per year for all nuclides.

With respect to the first inconsistency identified by EPA, DOE is following the MARSSIM process for characterizing the contaminants, and is only now engaged in the first step of that process, the "Historical Site Assessment." It appears EPA may have prematurely concluded the characterization is not sufficient, since the characterization phase, in both the MARSSIM and CERCLA processes, proceeds after both the Historical Site Assessment phase, and the Scoping Survey phase which is equivalent to the CERCLA process' Site Investigation phase, thus this "inconsistency" noted by EPA appears to be premature at this point in time.[5]

With respect to the second inconsistency identified by EPA, the distinction between risk and dose is primarily semantic, as noted earlier, since the risk to an individual is solely dependent upon the individual receiving a dose. It is noted again that while EPA disagrees with this position, the science is rather firm in this area, and even the EPA's own regulations require that the risk be assessed "using information on the relationship between dose and response" (40 CFR 300.430).

With respect to the third inconsistency identified by EPA, EPA's concern that DOE selected 15 millirem per year as a "point of departure" rather than the risk level of $10^{-6}$ is again an inconsistency in the process of remedy selection, and not an inconsistency in the final remedy that might be selected by EPA if they had jurisdiction over this site. As noted by the U.S. Government Accounting Office (GAO) in a full review of the inconsistencies between the NRC approach (essentially identical to DOE's at SSFL) versus the EPA approach, the GAO notes that "the EPA's approach has been described as "bottom up," setting a relatively restrictive risk goal, but allowing less restrictive limits in site-specific situations. While NRC's protection strategy has been described as a top down approach...setting a relatively less restrictive dose limit, but reducing doses and risks well below the limit in site-specific situations where the reductions are "reasonably achievable. Ultimately, this is a distinction in process, not in final criteria.

There are two other matters that are important to note with respect to the 15 mrem per year decommissioning criterion adopted by DOE for their SSFL facility. First, as a point of reference, one could compare the decommissioning criterion to the radiation dose received by an average individual in the U.S. from natural radioactivity in the ground, air, and water surrounding us.[6] That average dose is approximately 300 mrem per year, and varies from about

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[5] It is interesting to note here that in MARSSIM, Appendix F, the MARSSIM Scoping Survey phase is essentially equivalent to the CERCLA Site Investigation phase, which is the phase at which EPA would determine the Hazard Ranking System score for a site, and based on the score determine whether further investigations are necessary. In this case, EPA scored the SSFL site, with respect to the radiological contaminants, considerably below the 28.5 score that makes the site eligible for listing on the NPL. Thus, under the CERCLA process it is possible, or even likely, that no further investigations or removal actions would take place at the site with respect to the radiological contaminants.

[6] It is noted here that EPA objected to the discussion of natural background radiation as "not relevant." We strongly disagree with EPA and have included the information concerning natural background radiation since it is informative to place the level of dose (and risk) discussed here in the context of radiation levels populations naturally receive, that cannot be reduced.

one-half to twice this value depending upon where one lives in the country. So it can be seen that the criterion adopted by DOE for the SSFL site is approximately 5% of the average dose from natural radioactive materials, and is substantially less than natural radiation dose variations from one part of the country to another (or even within California).

The second important consideration is that EPA has entered into a Memorandum of Understanding (MOU) with NRC in which EPA agreed "to a policy of deferral to NRC decision-making on decommissioning without the need for consultation on sites other than those presenting the circumstances described elsewhere in the MOU." EPA objected to this proposed discussion of the MOU, claiming that it is not relevant, and declined to provide EPA's views on the MOU itself. Thus it should be made clear here that this discussion does not represent the EPA's position with respect to the MOU, but rather the view of radiation and regulatory experts outside of the EPA. While it is understood that the MOU has no specific application to the SSFL site, it is generally informative to consider alternative actions by EPA and other agencies in the country at sites with radiological contamination comparable to SSFL.

The MOU was developed at the behest of the U.S. House Appropriations Committee, in an attempt to bring clarity and finality to the cleanup and release of sites with residual radioactive contamination, and to end or substantially decrease the risk of dual regulation by the NRC and EPA at these sites. While not guaranteeing that dual regulation would not still occur, the MOU states that "EPA expects that the vast majority of facilities decommissioned under NRC authority will be decommissioned in a manner that is fully protective of human health and the environment." This is important because, as noted, NRC and DOE use essentially identical decommissioning processes. So, in essence the process used at SSFL would be effectively identical to that used at a typical decommissioning NRC site, and under other circumstances the EPA has conceded it generically expects this process will be "fully protective of human health and the environment."

**SUMMARY**

The inconsistency between the EPA and DOE requirements is primarily a process issue, rather than an issue regarding the protective value of the final decommissioning criteria used at the Rocketdyne Facility. Differences in processes, including site characterization and risk evaluation, may result in different final criteria. In general, these differences will not result in a measurable or verifiable impact to health and safety.

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